Amendments to the Drawings:

The attached sheets of drawings includes changes to Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9A, 9B, 10A, 10B, 11, 12 and 13. These sheets, which include Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9A, 9B, 10A, 10B, 11, 12 and 13 replace the original sheets including Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9A, 9B, 10A, 10B, 11, 12 and 13.

Attachment: Replacement Sheets

REMARKS

New drawings have been submitted correcting the matters pointed out in paragraphs 1, 2 and 3.

The specification has been amended to overcome the objections pointed out in paragraph 4. Additional changes have been made to avoid further objections and to place the application in better condition for allowance.

Claims 2, 3, 4, 5, 14 and 17 have been canceled without prejudice or disclaimer.

The claims have been amended to overcome the objections pointed out in paragraph 5. The objection to claim 12, line 2 with respect to the word "positions" is not understood, and it is believed that no correction in this regard is required.

The term "rotationally spaced" means angularly spaced about the axis of the brushroll. The term is believed to be commonly used in the art. See, for example, col. 5, line 16 of the Brundula Patent No. 6,530,106. In order to avoid further objection, the word "angularly" has been substituted for "rotationally" in the claims.

The term "dwell position" is defined in the specification on page 2, lines 7-12. It is the position of brushroll rotation in which rows of bristle tufts along at least one half the length of the brushroll will not be in sweeping contact with the carpet. In a dwell position, the portion of the carpet out of sweeping contact by the bristles is drawn up toward the mouth of the sweeper nozzle so that an up and down wave motion of the carpet occurs during brushroll rotation. Claims 1 and 9 have been amended to incorporate the definition of "dwell position".

The term "helix rotation" simply means the helical twist of a row of bristles tufts about the longitudinal axis of the brushroll (see page 2, lines 17, 18). In the embodiment of Figs. 1 and 2, for example, the rows 30, 31 and 32 have a helix rotation of about 18°. This means that each of these rows twists about 18° about the brushroll axis from one end of the roll to the other.

In claims 6 and 11, the term "rotationally opposed" simply meant on opposite sides of the brushroll. In claim 6, the word "angularly" has been substituted for "rotationally", and in claim 11 the two rows of tufts are defined as being "diametrically opposed".

Having in mind the foregoing explanations and definitions, it is submitted that the objections to the claims under 35 U.S. § 112 have been overcome.

As explained above and in the specification, the essence of the invention is a tuft pattern that promotes an up and down movement of the carpet during rotation of the brushroll. The bristle tufts are arranged in angularly spaced, helical rows so as to form dwell positions along at least one half of the length of the brushroll. In each dwell position, the bristle tufts are out of sweeping contact with the carpet so that the carpet is drawn up toward the nozzle. The up and down movement of the carpet which results from the dwell positions promotes a better cleaning action than achieved with conventional brushroll which have their bristles in constant sweeping contact with the carpet.

Claim 1 was rejected as being clearly anticipated by Hothersall. As amended, this claim calls for angularly spaced helical rows of tufts with the rows of

each section being angularly spaced from the rows of adjacent sections to form dwell positions wherein the bristle tufts along at least one half the length of the brushroll will be out of sweeping contact. As the Examiner notes, the bristle tuft rows of Hothersall are parallel to the longitudinal axis. Moreover, the tufting pattern of Hothersall does not define dwell positions in which the bristle tufts along at least one half of the brushroll length will be out of sweeping contact with the carpet. Hothersall appears very similar to the D'Costa et al. patent which makes it clear that there are no dwell positions extending at least one half the length of the brushroll. Accordingly, claim 1 is submitted to be patentable over Hothersall.

Claim 1 was were rejected as being clearly anticipated by Hoover. It is not clear which Hoover patent the Examiner is referring to, but neither appear pertinent to the claim in its present form. Hoover '270 discloses rows that are parallel to the longitudinal axis rather than being helical. Hoover '247 discloses a helical pattern in Fig. 3, but the pattern does not define dwell periods extending at least one half the length of the brushroll. As apparent from Fig. 3, some of the beaters and bristle tufts will be in contact with the carpet at all times along each half of the spindle axis. Accordingly, claim 1 is submitted to be patentable over both Hoover patents.

Claim 1 was rejected as being clearly anticipated by Brundula. The rows or groupings of bristle tufts shown in Figs. 1-6C of Brundula are parallel to the brushroll axis rather than being helical. With respect to the Examiner's assertion that Brundula discloses dwell positions, it is pointed out that there are no dwell positions extending at least one half the length of the brushroll. There is an angular

space with no tufts between 200 and 200A and between 300 and 300A, but these spaces are very short in length and would not result in an up and down movement of the carpet during brushroll rotation.

Claims 6-9 and 11-13 were rejected as being unpatentable over Hoover.

Claims 6-8 depend directly or indirectly from claim 1 and therefore include the limitations of angularly spaced helical rows of bristle tufts arranged in angularly spaced sections to form dwell positions wherein the bristle tufts along at least one half the length of the brushroll will be out of sweeping contact in each dwell position. As pointed out above, the rows of the '270 patent are parallel to the brushroll axis. There is no suggestion in this patent of the concept of a helical tufting pattern which defines dwell positions along at least one half of the brushroll length. The parallel rows produce a beating effect on the carpet that results in a noisier operation than a helical tufting pattern wherein the bristle tufts are progressively moved into contact with the carpet.

Hoover '247 shows a helical arrangement, but there is no suggestion of angularly spacing the rows so as to form dwell positions along at least one half the brushroll length.

With respect to claim 7, it has been found that the helix rotation of each row should be 45° or less in order to form the desired dwell positions. This concept is clearly not disclosed by Hoover '247 which shows no dwell positions at all in Fig. 3.

With respect to claim 8, the angular spacing of the helical rows of tufts should be no less than 90° minus the helix rotation in order to assure the formation of the

desired dwell positions. Again, the concept of forming dwell positions is clearly not disclosed in the helical arrangement of the '247 Hoover patent.

Claim 9 is similar to claim 1 except that it calls for two helically oriented rows in each section, each having a helix rotation of about 45° or less. Neither Hoover patent discloses brushroll sections, each having two helically oriented rows with a helix rotation of 45° or less.

Claims 11-13 depend directly or indirectly from claim 9 and are patentable over the art for the same reasons as claim 9. Claim 11 is specific to a construction having at least two diametrically opposed rows of tufts in each section of the brushroll. This is not disclosed by Hoover '270 where the rows are parallel or by Hoover '247 which has a single helical row of tufts extending the full length of the brushroll. Claim 12 calls for four dwell positions which are not suggested by either Hoover patent.

Claim 13 defines the helix rotation as being in the range of from about 15° to 20°. The Examiner's statement that it would have been obvious to one of ordinary skill in the art to determine the appropriate helical rotation in Hoover to allow for the most effective agitation of a surface is untenable, since Hoover does not disclose any helical tufting pattern having the defined dwell positions.

Claims 7-10 and 11-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Brundula.

Applicant disputes the Examiner's statement that Brundula discloses a similar brushroll. None of the embodiments of Brundula suggests a helical tufting pattern

having dwell positions extending at least one half the brushroll length.

The Examiner's statement with respect to claim 11 that it would have been obvious to one of ordinary skill in the art to determine the most appropriate rotational spacing in Brundula to allow for the most effective agitation for a surface is untenable, since Brundula does not disclose any helical pattern having the defined dwell positions.

Similarly, with respect to claims 7-9, 13 and 16, the Examiner's statement of what would have been obvious to a person of ordinary skill in the art is untenable since there is no suggestion in Brundula providing a helical tufting pattern defining the required dwell positions.

With respect to claim 10, it is true that Brundula discloses four sections in Fig. 1, but these sections are not angularly spaced to form the required dwell positions extending at least one half the length of the spindle. As pointed out above, the spacing between 200 and 200A and between 300 and 300A, etc. are too short to allow for up and down movement of the carpet.

With respect to the Examiner's comment concerning claim 12, it is pointed out that the tuft rows or groupings of Brundula in Fig. 1 are each parallel to the brushroll axis rather than being helical. The only helical rows disclosed by Brundula are shown in Fig. 7-7D. The helical pattern shown in these figures clearly does not provide dwell positions along at least one half the length of the brushroll.

With respect the Examiner's comments concerning claim 15, the rows or groupings of tuft e.g. 200, 200A, 300, 300A, etc. are all parallel to the brushroll axis

rather than being helically oriented.

Newly added claim 18 is similar to canceled claim 14, and defines the tuft spacing between the rows of the first and second sections as being about 72° and 108°, the tuft spacing between the second and third sections as being about 90°, and the tuft spacing between the rows of the third section and the fourth section being about 72° and 108°. This arrangement of helical layer oriented tufts is not suggested by any of the references of record. Accordingly, claim 18 should be allowed.

The Examiner is respectfully requested to call the undersigned attorney if there are any remaining questions concerning terminology and distinctions between the claims and the prior art.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. 35651.

Respectfully submitted,

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